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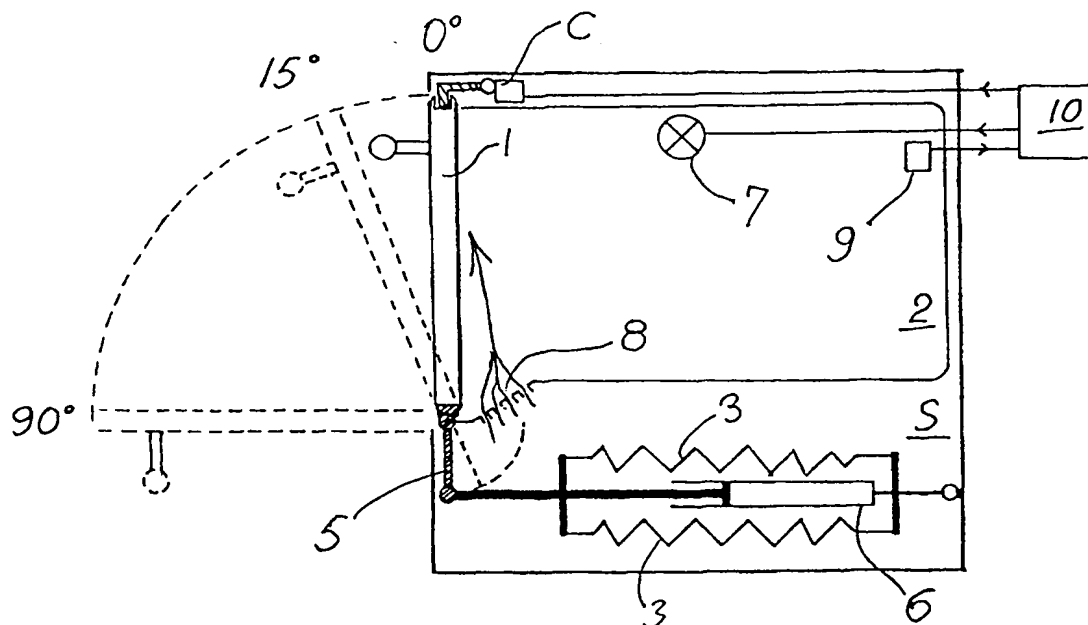
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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/DK00/00093 (22) International Filing Date: 6 March 2000 (06.03.00) (30) Priority Data: PA 1999 00313      4 March 1999 (04.03.99)      DK (71) Applicant (for all designated States except US): AKTIEBO- LAGET ELECTROLUX [SE/SE]; S-105 45 Stockholm (SE). (72) Inventors; and (75) Inventors/Applicants (for US only): ESKILDSEN, Christian [DK/DK]; Dammen 14, DK-5591 Gelsted (DK). JEAN- NETEAU, Laurent [FR/FR]; 32, rue des Sablons, F-60200 Compiègne (FR). (74) Agent: BROCK-NANNESTAD, George; Patent Tactics, Rese- davej 40, DK-2820 Gentofte (DK).		(81) Designated States: AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  Published With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.	

(54) Title: A DEVICE FOR TERMINATING COOKING AND INDICATING STATUS



## (57) Abstract

The end of cooking or baking in an oven may be determined by presets or by the measurement of suitable parameters. The end triggers an automatic opening of the door in order to advertise the status. The door opening may be combined with a sudden change in the strength of the cavity light when the operation is automatic, whereas manual closing and opening causes the light to fade out or in. A partial opening to signal end of cooking and venting is accompanied by flashes of light.

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A device for terminating cooking and indicating status.

- 5 The invention relates to a device for terminating cooking and indicating the status in an oven for the preparation of food comprising an oven cavity and an oven door.

Ovens which are set by a timer to a finishing time are well known and they exist in simple user-set versions or in more elaborate versions where the finishing time is  
10 calculated internally in the oven control circuitry, e.g. by measured parameters. Simple ovens may be set to switch-off the power supply at the finishing time, and more elaborate ovens may calculate the remaining heat in the oven and perform the switching-off before the actual finishing time. The parameters measures may be temperature, humidity or composition of fumes developed within the cavity, and  
15 advanced data processing may be used in order to determine the development of cooking in each particular instance.

The known methods are not suitable for all cooking/baking, in particular for food which is designed to be taken out of the hot cavity at the correct instant. In such  
20 cases, it is not a question of programming the oven to switch off but to programme the user to act, either at a given time or when a specific condition of done-ness has been established in the oven. The reaction of a user - or the non-reaction, as the case may be - is an unpredictable parameter, and hence known ovens do not give the impression of functioning properly at all times. Simply put, if the user forgets to take  
25 the food out of the oven at the correct time, it will be overcooked. There is hence a need to provide technical means to minimise the consequences of lack of user cooperation. There is a further need to communicate to the user by other means than the activation of a sounder, such as the ringing of a bell.

- 30 It is the purpose of the invention to provide an oven in which the above disadvantages and limitations have been eliminated in an efficient and economic manner.

This is obtained by letting the advent of the finishing time trigger the release of the oven door so that it opens positively. This measure will bring about either proper cooling, in case the contents have been forgotten by the user, or it will advertise the fact that the cooking has been finished, both visually in large-scale, and olfactory, because the opening which has a much larger cross section than ordinary vents, will provide full exit of steam and fumes.

In an advantageous embodiment the primary opening of the door is only partial. This has the advantage of preserving child safety, preventing access to the escaping steam and fumes. Such a positive partial opening may be followed by a full opening after an optional cooling-off period.

In a further advantageous embodiment the opening of the door is accompanied by a turning on of the oven cavity light. This provides a further indication of the action of the oven door, in that the presence of a cloud of steam will be advertised by light from behind.

In a further advantageous embodiment, the oven door and oven cavity light are linked such that any manual closure or opening of the oven door causes a gradual change in light intensity from full light to dark and from dark to full light respectively, whereas a cooking status triggered door operation causes a sudden light intensity change. The user will perceive the calm and confident handling of the food by the automatic oven when operating it, while being rudely advertised of the finishing time by the instant presence of light and steam and fumes.

25

A further embodiment is particular in that the triggering of the door opening is obtained by means of signals from smoke detecting means. This has the added advantage that an erroneous adjustment of the cooking parameters at the initiation of cooking will not result in charred food, because the door opens and the oven switches off. As a minimum result of this provision, the need for cleaning of the cooking vessels and oven are simplified, and there is an increased chance of re-cooking and obtaining useful cooked food in spite of the original erroneous adjustment.

A further embodiment is particular in that the triggering of the door opening is obtained by means of signals representative of a reduction of the amount of steam developed over time. This feature is food dependent and would represent e.g. cakes and bread.

The fundamental aspect of the invention is the combination of creating a fast normalisation of the cooked food with advertising that it is finished. This is brought about by the means defined in the claims. A further aspect is that of safety, in particular for children, when a kitchen appliance which stores a large amount of thermal energy, suddenly releases it. Hence the provision of a gradual opening of the door in order to prevent children from obtaining direct access to large areas of hot surface. The triggering of the door release is obtained by a signal which represents that cooking has finished, and a number of signals may be used to this end. The door will not only be released, but it will be opened positively, i.e. by means of the release of energy stored in a spring or by means of a motor. The latter is the choice when the door is actually made like the front of a drawer which slides out from the oven.

The invention will be described more fully in the following with reference to the drawings in which

Fig. 1 shows a spring-loaded door with a trigger device and two-stage opening, and

Fig. 2 shows the cavity light intensity as a function of time and closure, respectively opening, of the oven door in the cases that a manual operation is performed or a triggered operation.

In Fig. 1 is shown an oven door which is closed shut against a spring force as a storage device, or a motor creating a suitable resistance. The oven door 1 is closed against the cavity 2 when it is at 0° opening angle. The spring arrangement 3 acts on a lever 5 at the bottom of the door (however, many practical, similar embodiments are possible) in order to open it against the resistance of the dashpot 6. The oven door is indicated in 3 positions: 0°, 15°, and fully open at 90°. The position of the

door is linked to the level of light emitted by a suitably fitted lamp 7. A blower is connected to the space S and may through openings 8 blow a stream of air along the oven door 1 to draw fumes out and to cool the door when it is in the limited opening position at  $15^\circ$ . A humidity sensor 9 is connected to the control electronics 10 which in turn controls the blower and release means for the door C.

As shown in Fig. 2, upon closing the light in the cavity will gradually decrease, which is shown at the middle part of the graph ( $t_3 - t_4$ ). If the oven is to be opened manually, this does not occur by pulling a handle, but by pushing a control button which is suitably linked to a catch C. The actual opening does not occur until the light has increased gradually from zero ( $t_1 - t_2$ ), and then the door opens, driven by a spring force or a motor but at a slow speed commensurate with the perceived speed in increasing the light. This is shown in the left-hand part of the graph. A suitable combination of the two speeds which will be easily determined by the skilled person will create a sense of elegance, of luxuriousness, thereby adding value to the product. Similarly, the closing of the door does not need to be performed manually but may occur through motor drive in conjunction with the changing light level.

In case the door opens because a cooking operation has finished, it has been found expedient to make a decided contrast in the manner in which the light inside the cavity changes, i.e. to let the opening be accompanied by a sudden increase in light. Alternatively, the light may be set to flash at an insistent rate, at least for the time that the oven door is only partly open, and changing for a stable light when the oven door is manually activated in order to remove the cooked food. This is shown in right-hand part of Fig. 2, in which it is seen that for the chosen opening angle of the oven door, *in casu*  $15^\circ$ , the light flashes insistently until the time  $t_6$ , whereupon it changes to normal combined opening and light change. During the time from  $t_5$  to  $t_6$  a blower fitted into the oven door drive compartment blows cooling air taking from outside the oven cavity over the inside of the door as well as carrying the smell of finished food into the living quarters.

The skilled person will be able to devise any suitable combination of light and opening according to special needs.

## PATENT CLAIMS

1. A device for terminating cooking and indicating the status in an oven for the preparation of food comprising an oven cavity and an oven door,  
5 characterised in that the advent of the finishing time triggers the release of the oven door so that it opens positively.
2. A device according to claim 1,  
characterised in that the primary opening of the door is only partial.
3. A device according to claim 1,  
10 characterised in that the opening of the door is accompanied by a turning on of the oven cavity light.
4. A device according to claim 1,  
characterised in that the oven door and oven cavity light are linked such that any manual closure or opening of the oven door causes a gradual change in light  
15 intensity from full light to dark and from dark to full light respectively, whereas a cooking status triggered door operation causes a sudden light intensity change.
5. A device according to claim 1,  
characterised in that the triggering of the door opening is obtained by means of signals from smoke detecting means.
- 20 6. A device according to claim 1,  
characterised in that the triggering of the door opening is obtained by means of signals representative of a reduction of the amount of steam developed over time.
7. A device according to any of the preceding claims,  
25 characterised in that the advent of finishing time releases the door to a limited opening which is less than full opening.
8. A device according to claim 7,  
characterised in that a blower blows air taking from outside the oven cavity over the inside of the door in order for it to exit through the limited opening.



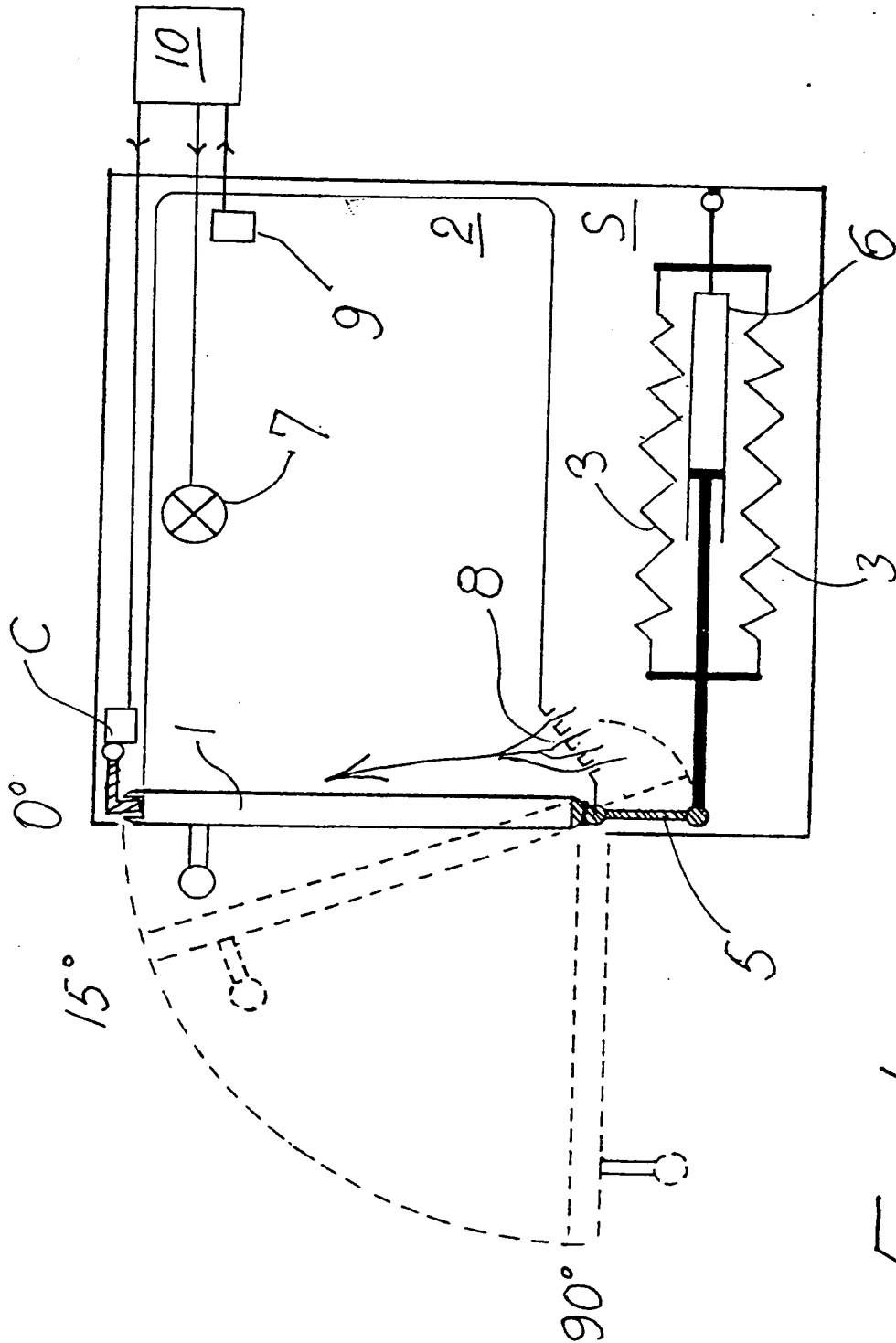
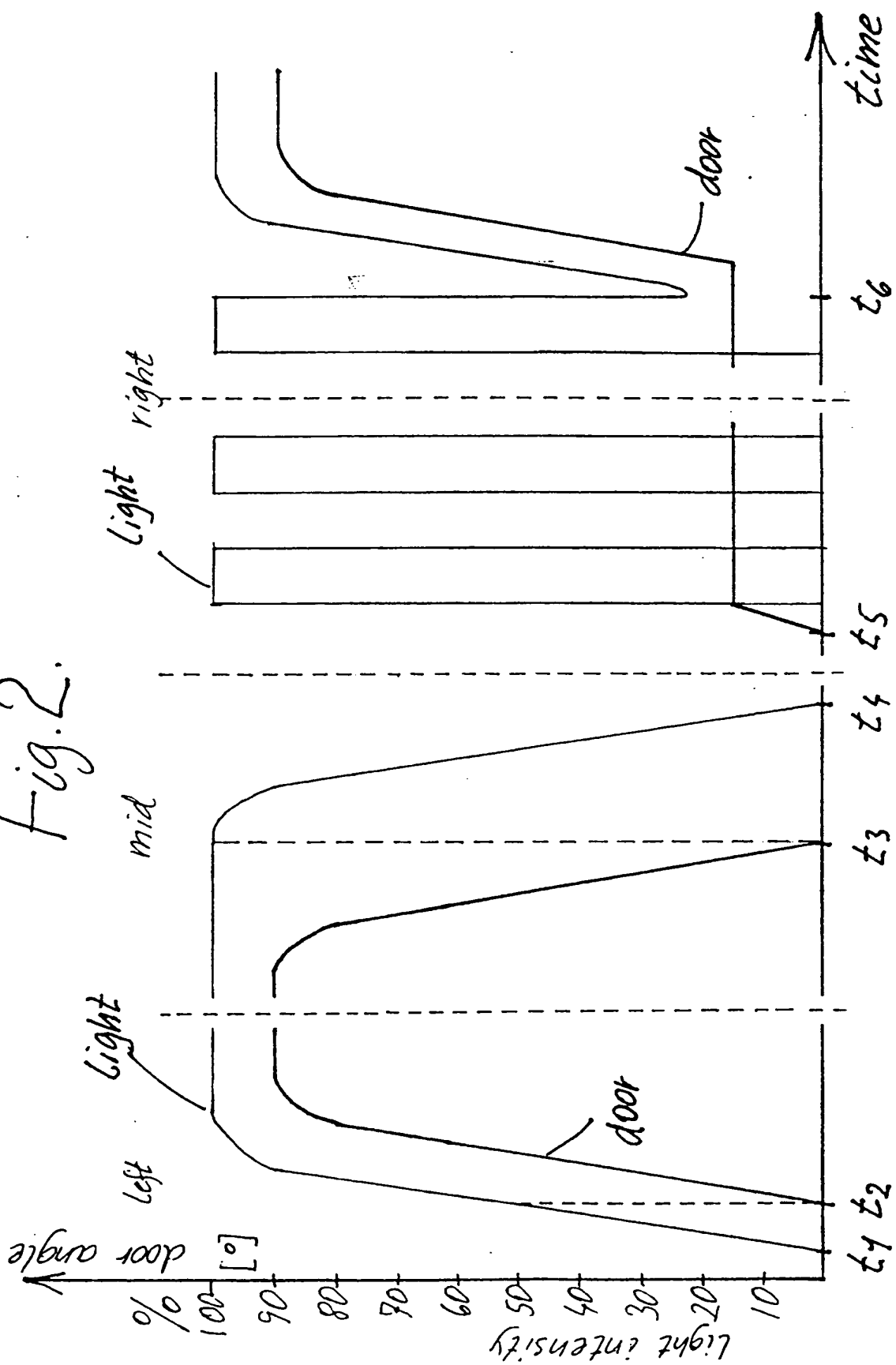


Fig. 1.

Fig. 2.



1  
INTERNATIONAL SEARCH REPORT

International application No.  
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A. CLASSIFICATION OF SUBJECT MATTER

IPC7: F24C 7/08 // F24C 7/02, F24C 15/02, H05B 6/80  
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: F24C, H05B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Patent Abstracts of Japan, abstract of JP 9-33051 A (SANYO ELECTRIC CO LTD), 7 February 1997 (07.02.97), see the whole document	1,2,3,5,6,7
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&	JP 9-33051 A (SANYO ELECTRIC CO LTD), 7 February 1997 (07.02.97), figures 1-5	1-3,5-7
	--	
X	US 5767493 A (WERNER LAUTENSCHLÄGER), 16 June 1998 (16.06.98), column 2, line 5 - line 25, figures 1, 2	1,2,3,5,6,7
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☒ Further documents are listed in the continuation of Box C.

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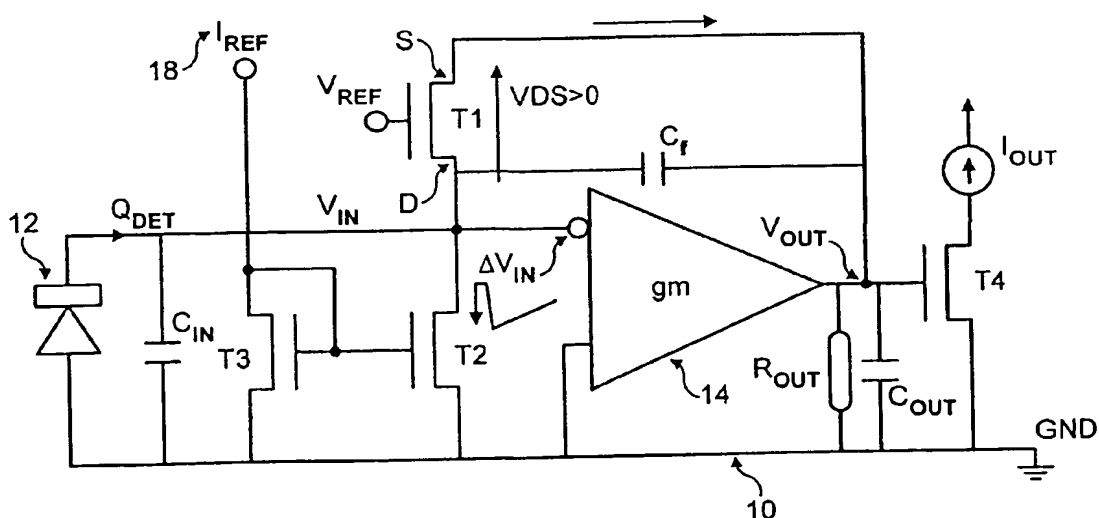
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: CHARGE OR PARTICLE SENSING



(57) Abstract: A sensing arrangement for sensing charged particles and/or quanta of electromagnetic radiation has a sensor device 12 and amplifier circuitry 14;M1,M4. The sensor device provides a sensor signal to an input node V<sub>in</sub> of the amplifier 14;M1,M4 to cause the level at the amplifier output node V<sub>out</sub> to change. A negative feedback device T1;M2 responds to the change in level of the output node to vary the feedback effect to increase the loop gain of said amplifier circuitry. A current mirror T2,T3;M3,M6 resets the input node to its initial level. Single particle and integrating sensor arrangements are disclosed.

WO 03/061277 A2

## CHARGE OR PARTICLE SENSING

### FIELD OF THE INVENTION

5 The invention relates to a sensing arrangement, a detection system, a macropixel and a method of detecting the arrival of one or more charged particles and/or one or more quanta of electromagnetic radiation.

### BACKGROUND OF THE INVENTION

10 Conventional pixel radiation sensors are often based on a hybrid approach in which an electronic circuit is bump bonded to a pixel sensor.

There are a number of types of conventional semiconductor imagers and sensors. One class is based on a hybrid pixel sensor arrangement for two-dimensional single particle detection, or single photon detection. Another class  
15 uses monolithic active pixel sensors (APS) that are solid state imagers that provide, for each pixel, radiation-sensing, charge-to-voltage conversion, and a reset function.

The hybrid pixel sensor arrangement is mainly used for IR focal planes, Silicon  
20 Pixel arrays for single particle detection, X-ray detection and medical imaging. The hybrid pixel sensor permits independent optimisation of the radiation detector characteristics and the pixel readout electronics because they are fabricated on two separate substrates with two different processes. However, this type of pixel sensor has a limit to the minimum achievable pixel  
25 dimensions due to the bump bonding technique. So far 50µm x 50µm has been achieved, but it is expensive and complex to fabricate. Moreover, the hybrid



US005767493A

**United States Patent** [19]**Lautenschläger**[11] **Patent Number:** **5,767,493**[45] **Date of Patent:** **Jun. 16, 1998**[54] **HEATING CHAMBER WITH PRESSURE RESPONSIVE DOOR MOUNTING**[75] **Inventor:** **Werner Lautenschläger, Leutkirch, Germany**[73] **Assignee:** **Milestone Inc., Monroe, Conn.**[21] **Appl. No.:** **700,437**[22] **PCT Filed:** **Jan. 5, 1995**[86] **PCT No.:** **PCT/EP95/00046**§ 371 Date: **Oct. 29, 1996**§ 102(e) Date: **Oct. 29, 1996**[87] **PCT Pub. No.:** **WO96/21075****PCT Pub. Date:** **Jul. 11, 1996**[51] **Int. Cl.<sup>6</sup>** ..... **H05B 6/68**[52] **U.S. Cl.** ..... **219/723; 219/702; 219/739; 219/686; 219/757**[58] **Field of Search** ..... **219/723, 722, 219/724, 739, 686, 702, 704, 757**[56] **References Cited****U.S. PATENT DOCUMENTS**1,944,156 1/1934 Feltham ..... 110/173 B  
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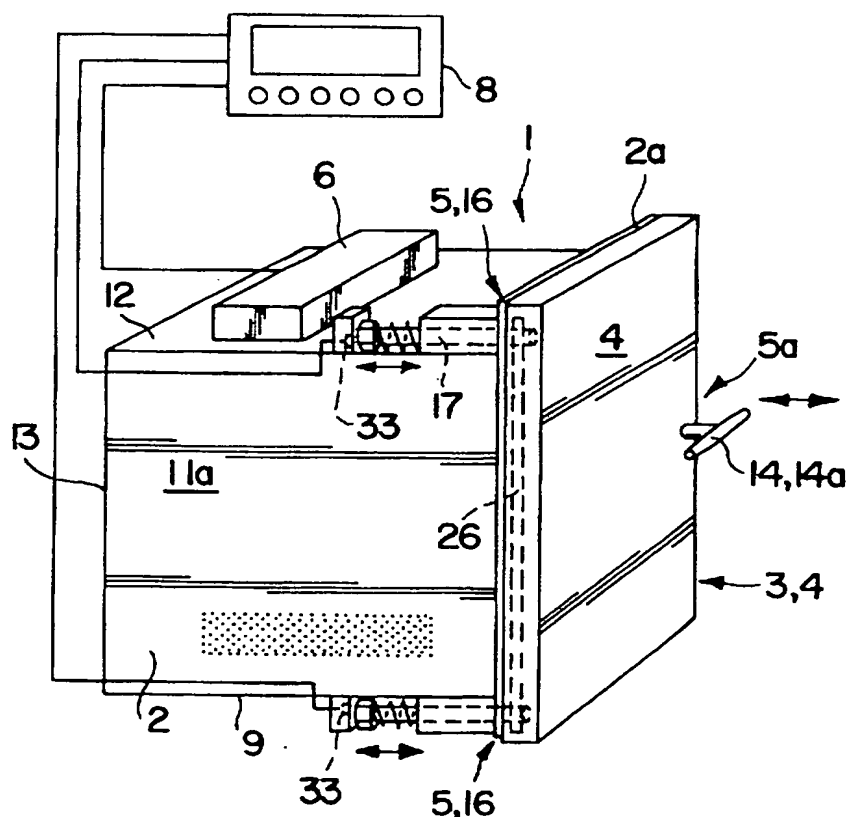
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4327381A1 2/1995 Germany .

59-35726 2/1984 Japan ..... 219/739

**Primary Examiner**—Philip H. Leung**Attorney, Agent, or Firm**—Fitzpatrick, Cella, Harper & Scinto[57] **ABSTRACT**

In a device (1) for the treatment of materials under the action of heat, and if appropriate also pressure, in a heating chamber consisting of a housing (2), containing the heating chamber, having a charging opening for the heating chamber which can be selectively opened or closed by means of a door (4), and a heating device (6), in particular a microwave heating device, for the heating chamber (7), the door (4) is so mounted that when a particular pressure in the heating chamber is exceeded it lifts off from the door frame (2) and is movable into a relief-opening position, out of which position it is moveable back into the original-closed position—after reduction of pressure—either automatically or by the application of force.

**19 Claims, 2 Drawing Sheets**

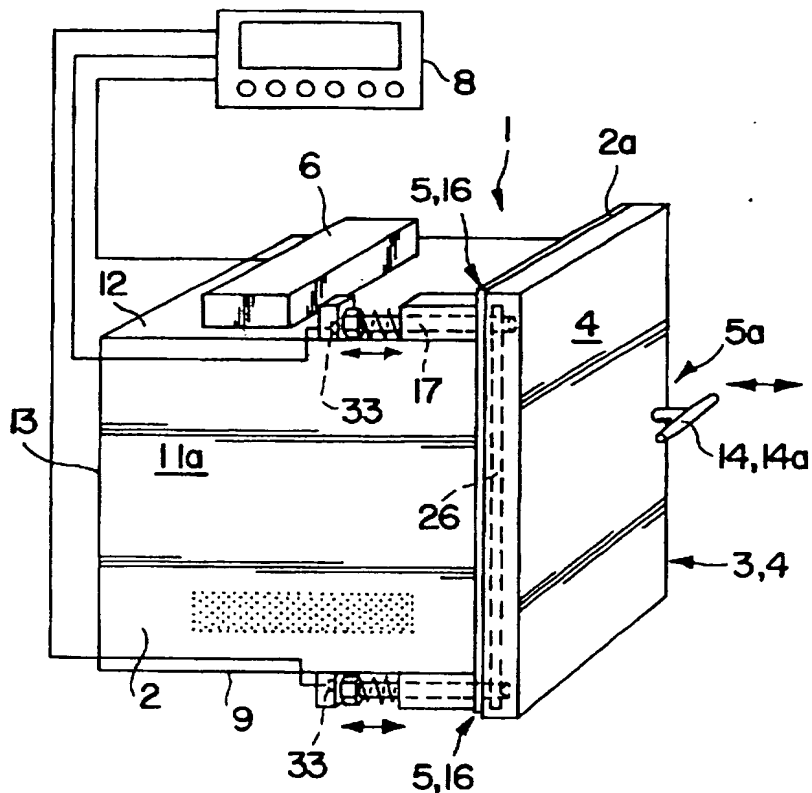


FIG. 1

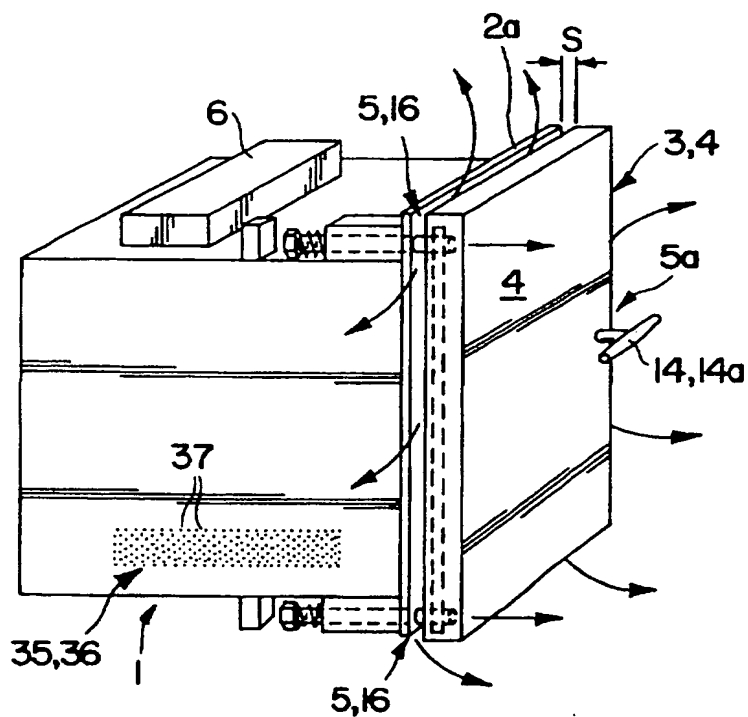
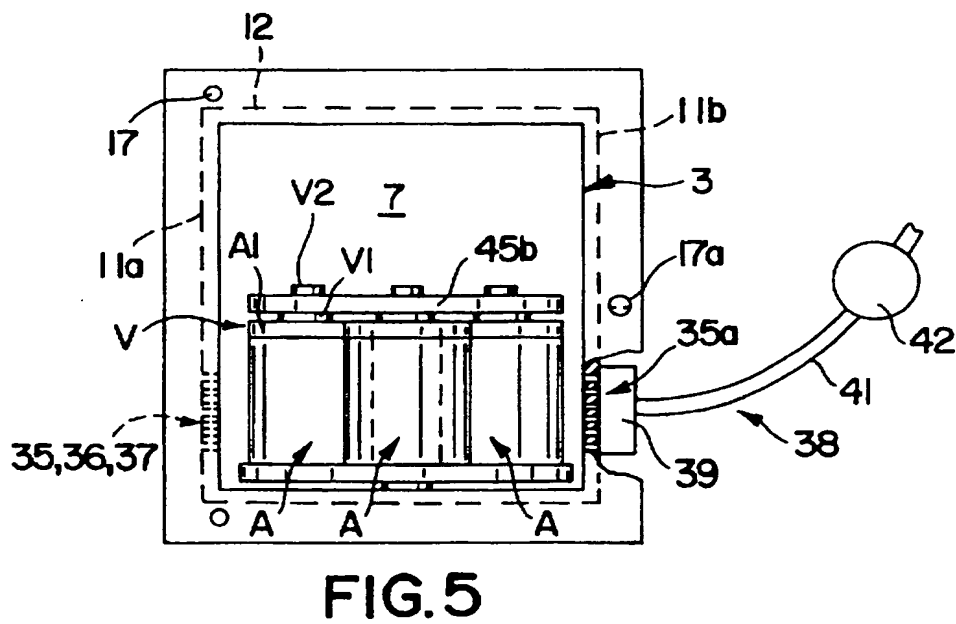
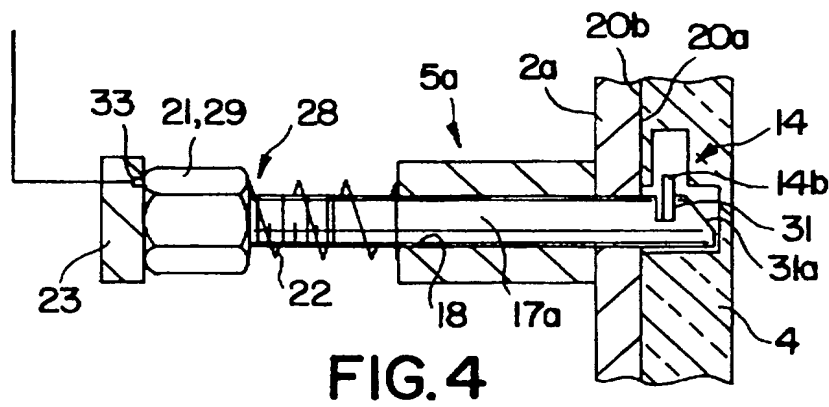
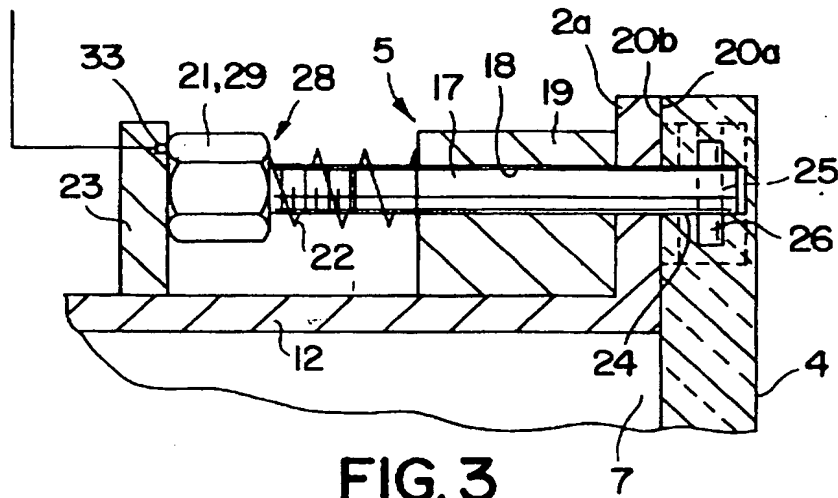


FIG. 2





# HEATING CHAMBER WITH PRESSURE RESPONSIVE DOOR MOUNTING

## BACKGROUND OF THE INVENTION

### Field of the Invention

The invention relates to a device for the treatment of materials; and more particularly, it concerns a novel device having a heating chamber which is selectively opened and closed by a door.

### DESCRIPTION OF THE RELATED ART

Devices of this kind are employed for initiating, promoting and/or carrying through chemical or physical processes in materials and/or for the preparation of materials in each case with relatively great heating and/or simply for the heating of materials for various purposes.

Thereby, there may be involved measures for separation of materials and/or preparation of materials in particular for the purpose of analysis and/or for the preparation of materials, e.g. heating or baking of foodstuffs for consumption.

With the above-described measures, because of the effect of the heat and evaporation of the material to be heated or of components of the material there is a pressure increase in the heating chamber which in particular in the case of a large volume heating chamber and a large area closure element can lead to an overloading and thus damaging of the parts retaining the closure element in its closure position. With a pressure increase in the heating chamber of only about 0.5 bar, there is in the case of a charging aperture of about 40 cm×40 cm a pressure loading of 800 kg on the inner surface of the closure element. Conventional mounting constructions for the closure element are not designed for such a loading. Such a design would also make more difficult the integration of the mounting elements and further lead to a disadvantageous and costly construction.

The above-described problems are present both when the material is treated in special closable sample containers or is treated directly in the heating chamber. In the first case, because of the pressure increase, there often occurs a bursting or exploding of the sample container or containers, whereby the pressure propagates into the heating chamber and places this likewise under pressure. In such devices or treatments in which the material to be treated is placed directly into the heating chamber, the latter is directly set under pressure.

The above-described problems occur with devices of the present kind in the case both of commercial use and also domestic use. An example of a domestically useable device is e.g. a domestic microwave oven which likewise suffers the above-described disadvantages and is also at risk for the above-mentioned reasons.

### SUMMARY OF THE INVENTION

The object of the invention is to protect a device of the kind indicated in the introduction from an overloading resulting from a damaging internal pressure.

All solutions in accordance with the invention contribute to the protection of the device from overloading and thus contribute to a protection from explosions.

According to one aspect of this invention, there is provided a device for the treatment of materials under the action of heat, and if appropriate, also pressure, in a heating chamber. The device is formed with a charging aperture

which opens into the heating chamber; and this aperture can be selectively opened and closed by means of a door which normally presses against a frame around the aperture. A heating device, such as a microwave generator, is provided for the heating chamber. The door is so mounted that upon a particular pressure in the heating chamber being exceeded, the door lifts off from the frame and moves to a relief-opened position; and, after the reduction of pressure, the door can be moved back into the original position either automatically or by the application of force.

With the above described configuration in accordance with the invention, an overpressure in the heating chamber is automatically released, so that overloading cannot arise. The door, standing in its relief position, can thereby fulfil a monitoring or indicating function from which it is apparent to the operating person that an overpressure was present.

Thereby, a maximum loading of the device or of the door can be limited by means of the force of a spring which biases the door into its closed position. In the case of an internal pressure exceeding the thereby predetermined pressure parameter, the door is moved against the biasing force of the spring, whereby an opening gap appears through which the pressure can escape, whereby the overloading is prevented. With such a configuration working can take place with an overpressure in the heating chamber which is lesser than the bias force.

According to a specific embodiment of the invention, the housing has a set of perforations, whereby an overpressure is prevented from arising, since the overpressure can escape through the perforations. This configuration in accordance with the invention is suitable for measures for the heat treatment of materials which take place at normal pressure or room pressure and/or at an under-pressure in the heating chamber.

According to a further specific embodiment of the invention, a pressure sensor is associated with the heating chamber which together with a control or regulation device reduces or so controls the heating power that a particular internal temperature is not exceeded or the heating is turned off. In all these cases, the internal temperature is limited or reduced so that through these means a damaging or dangerous increase in the internal pressure is avoided. This configuration in accordance with the invention is suitable in particular for combination with the configuration in accordance with the invention in particular when the heating device is a microwave heating device. With such a combination, the movable closure element may be the pressure sensitive part of the pressure sensor which brings about a switching off of the microwave power. By these means, not only is the temperature in the chamber reduced but it is also prevented that microwaves escape to the outside through the gap formed upon movement of the closure element between the latter and the housing.

Additional specific features of the invention as embodied herein involve features which improve the functions of the device or the mounting of the closure element and provide for simple, compact and economically manufacturable constructions which also make possible a purposive treatment and special treatments of the material.

### BRIEF DESCRIPTION OF THE DRAWINGS

Below, the invention and further advantages which can be achieved thereby will be described in more detail with reference to preferred exemplary embodiments as shown in the accompanying drawings in which:

FIG. 1 is a perspective view showing a device in accordance with the invention and, in particular, showing a door in a first position;

3

FIG. 2 is a view similar to FIG. 1 but showing the door in a second position; is a view similar to FIG. 1 but showing the door in a second position.

FIG. 3 is a fragmentary section view showing one form of door mounting arrangement for the embodiment of FIG. 1;

FIG. 4 is a fragmentary section view showing a door locking arrangement for the device of FIG. 1; and

FIG. 5 is a front elevational view, partially cut away, of a housing for the device of FIG. 1, with the door removed;

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring first to FIGS. 1 and 5, a device 1 according to the present invention, comprises; a block-like housing 2 having a front charging aperture 3 (FIG. 5) which can be selectively opened or closed by means of a swing door 4, elastically yielding mounts 5 for the swing door 4, a heating device 6, in particular a microwave heating device, for heating a heating chamber 7 arranged in the housing 2, and an electrical control and/or regulation device 8 which is connected with the associated control or regulation elements of the device 1 by means of control or signal lines and is equipped with automatically functioning control and regulation elements and, if appropriate, with a keyboard for manual setting.

The housing 2 is of block-like form and has a floor wall 9, two side walls 11a, 11b, a ceiling wall 12 and a rear wall 13, whereby the front wall is formed by means of the swing door 4 and closes the front charging aperture 3 in its closed position.

As shown in FIG. 1, there is provided a heating device 6. The heating device 6 has a magnetron, which may be arranged e.g. over an opening on the ceiling wall 12 (not shown) and through which the microwaves are coupled into the heating chamber 7. The housing 2 is of metal, whereby the swing door 4 may also be partly of transparent material, e.g. glass. In this case it is however prevented, by measures known per se (metal grids), that microwaves can emerge through the glass.

In the present configuration, the swing door 4 is mounted swingably by means of two yielding joint mounts 5, arranged at the upper and lower corner regions, respectively, at one side; and the door 4 is closable by means of a locking device 14 arranged on the other side. The locking device 14 has an externally accessible handle 14a and a vertically movable key bolt 14b (shown in FIG. 4) connected therewith in conventional manner. The overall two yielding joint mounts 5 is essentially the same, except that they are arranged in a mirror-image manner with regard to a horizontal middle plane. For purposes of simplicity, therefore, only the upper yielding joint mount 5 will be described.

The joint 16 of the yielding joint mount 5 consists of a joint part associated with the housing 2 in the form of a joint bar 17 preferably circular in cross-section which extends at right angles to the plane of the door 4 and which is guided and mounted in a guide hole 18 of a mounting piece 19 displaceably along its middle axis, i.e. likewise at right angles to the plane of the door. The joint bar 17 penetrates the mounting piece 19 and projects beyond it to the rear, whereby a compression spring 22 is spanned between a thickened bar head 21 and the mounting piece 19, which (biases) the joint bar 17 to the rear against a stop 23 which may advantageously be formed by means of a stop piece attached on the housing 2 behind the bar head, here on the ceiling wall 12 of the housing.

The joint bar 17 extends forwardly beyond the plane of the charging aperture 3 (FIG. 5) and engages into a hori-

4

zontal joint recess 24 (FIG. 3) of the swing door 4, with play for movement. Within the swing door 4, the joint bar 17 has a vertical joint bore 25 in which a joint pin 26 is mounted with play for movement, which joint pin is held on the swing door 4. The joint recess 24 is so large horizontally that the swing door 4 can be swung more than 90°, whereby the door is mounted with the horizontal limiting walls of the joint recess 24 on the two joint bars 17 present. The stop or stops 23 are so positioned that with abutment of the bar head or heads 21 due to the biasing of the spring 22, the swing door 4 abuts with its abutment surface 20a on the abutment surfaces 20b surrounding the charging aperture 3, if appropriate by means of a seal (not shown) and thereby closes the heating chamber 7. The later abutment surface 20b may also be arranged on a flange 2a surrounding the charging aperture 3.

Preferably the yielding joint mount 5 is integrated in an adjustment device designated generally with 28 which makes possible an adjustment and setting of the swing door 4 at right angles to its plane, in order to adapt the door to the abutment surface 20b taking into consideration the tolerances present. With the present configuration, the adjustment device 28 is formed by means of a telescopic joint rod 17 whereby its rear end region has a thread onto which there is screwed a threaded nut 29—preferably lockably on the thread—which slightly projects beyond the rear end of the joint rod 17 and is thus suitable for length setting. A yielding mount 5a is provided in the region of the locking device 14 is formed in substance the same as the yielding mount 5 in the region of the joint 16—see the same parts with the same reference numbers—whereby however instead of a joint 16 at the forward end of the locking bar 17a there is provided a locking recess 31, if appropriate with an approach slant 31a of the thus formed locking part. The locking bar 17a is adjustable in the same manner as the joint bar 17. There is to be associated with the locking bar 17a, so far as it is circular, a means preventing rotation thereof, since it is not secured against rotation as is the joint bar 17 by means of the joint pin 26 in the door.

With the above-described configuration, the yielding joint mounts are arranged on the ceiling wall 12 or under the floor wall 9 and attached thereto, and the yielding locking device 14 is mounted on the outside on the associated side wall 11b. Within the scope of the invention, however, other arrangements are possible, e.g. the two joint mounts 5 may be mounted on the inside or the outside on the associated side wall 11a or integrated therein.

Within the scope of the invention it is possible to correspondingly retain and mount a lid (not shown) or a swing door arranged on the upper side (not shown).

For a heat treatment process of a material this is placed, preferably in at least one receptacle A (FIG. 5), in the heating chamber 7 and the heating device switched on, whereby the material is heated by means of the microwaves directly or also indirectly, as is known per se. Vapours thereby appearing, and temperature and/or pressure rises connected therewith, can increase to such a level in the heating chamber 7 that the compression springs 22—dimensioned in accordance with a particular pressure value and exercising a corresponding bias—are overcome and the swing door 4 lifted off from the abutment surface 20b. Hereby, there arises a gap S illustrated in FIG. 2, through which an overpressure exceeding a predetermined pressure value can escape to the outside. By these means, the loading of the spring door 4 and its mounting and locking means is limited to a value so that these parts, with regard to their strength, need only be made so robust that they can accept the demands at the predeter-

mined pressure value. This applies naturally also for the housing 2, because a higher internal pressure cannot arise.

It is also advantageous to associate with the heating chamber 7 a pressure sensor which monitors the internal pressure and at an internal pressure which may be equal to the predetermined pressure value or may also correspond to a lesser pressure value, switches off the heating device 6 and in particular a microwave heating device, so that no microwaves can escape to the outside through the gap S.

The gap S preferably in the range of 1 to 5 mm.

An above-mentioned pressure sensor may in advantageous manner monitor the position of the swing door or components mounted on the same; and, in the event of a movement, the pressure sensor may deliver a signal to the control device 8 (FIG. 1). With the present configuration, two pressure sensors are formed by means of switches or microswitches 33 which are preferably arranged between the stop pieces 23—in particular therein or thereon built-in or built-on—and the rearward ends of the joint rods 17 and deliver a signal upon lifting off of the swing door 4.

The parts of the yielding joint mount 5 and locking mount 5a may be of metal.

As shown in FIG. 5, with the above-described exemplary embodiments, instead of or in addition to the elastically yielding door mount, there may be provided in a wall or in one or in both side walls 11a, 11b, a set of perforations 35 in a part region 36 of the associated wall. The part region 36 is located preferably in the lower region of the housing. The set of perforations comprises a plurality of holes 37 the cross-sectional size of which is so large—taking into consideration the wall thickness and the wavelength of the microwaves—that no microwaves emerge from the holes 37. In the present configuration, circular holes are provided, the cross-sectional size or diameter of which is 2 to 4 mm. The thickness of the side wall 11a and also 11b may thereby be about 1 mm.

The number of the holes 37 is such that, in the case of a spontaneous pressure increase to be expected, the pressure can escape through the holes 37 without the device 1 suffering damage or exceeding a particular pressure value. With this configuration, a treatment of the material in the heating chamber 7 is in substance possible only at normal or room pressure.

The perforations 35 are, however, also suitable advantageously in combination with an elastically yielding held swing door 4 when the perforations are only so large that despite the perforations there can arise in the heating chamber 7 a pressure exceeding the predetermined pressure value which brings about the abovedescribed lifting off of the door.

The perforations 35 may also be a part of a ventilation system 38 for heating chamber 7. In this case, there is provided at another location of the housing 2, preferably an opposite location, e.g. in the other side wall 11b, a second set of perforations 35a in a corresponding manner, whereby one of the sets of perforations—here the perforations 35a—is provided at a suction or pressure device for air or a gas, e.g. an inert gas. In accordance with FIG. 5, the perforations 35a are connected by means of a collector 39 and a connected pipe or tube line 41 with a pump 42 which transports the air or a gas from a gas source through the heating chamber 7 by suction or pressurisation. Here, a cooling and/or flushing device for the heating chamber 7 may be involved. In particular in the case of a flushing device for transporting away vapours out of the heating chamber 7 it is advantageous to connect the discharge line to a chimney or to a device for analyzing the vapours.

With the configuration according to FIG. 5, one or more receptacles A may be provided which are each sealingly closable by means of a receptacle lid A1 and with each of which an over-pressure valve V is associated which opens at a receptacle pressure exceeding a predetermined value. Preferably, the associated valve body is the receptacle lid A1 itself which is biased into its closed position by means of a spring element V1, e.g. by means of a settable pressure part, preferably in the form of a setting screw V2.

With the configuration according to FIG. 5, there is provided a carousel 45 having a carrier disk 45a and a cover disk 45b, rotatable or swingable to and fro by means of a drive (not shown), whereby the setting screws V2 are vertically screwed into and preferably accessible from above the cover disk 45b. The receptacles A, with the spring element V1 preferably arranged thereon, are mounted between the setting screws V2 and the carrier disk 45a.

I claim:

1. Device for the treatment of materials under the action of heat and pressure, in a heating chamber, said device comprising a housing containing a heating chamber, said housing being formed with a charging aperture for the heating chamber, said aperture being surrounded by a door frame on said housing, a pivotal door which can be moved to selectively open and close said aperture, and a microwave heating device for the heating chamber, characterized in that:

the device also includes a first mounting structure which mounts said frame to said housing and a second mounting structure which mounts said door to said frame, one of said mounting structures including a releasable locking device and allowing pivotal movement when the locking device is released, and the other mounting structure including a pressure responsive holding device which permits limited linear movement in response to excessive pressure within the chamber.

2. Device according to claim 1, characterized in that, in the relief-opened position there is a gap between the door frame and the door.

3. Device according to claim 1 or 2, characterized in that, the door is elastically biased into its closed position and is movable transversely of the opening surface of the charging aperture.

4. Device claim 1, characterized in that, the door is a swing-lid.

5. Device claim 1, characterized in that, the door is arranged at a side of the housing (2).

6. Device according to claim 1, characterized in that, the housing in vertical cross-section has a right-angled or quadratic form and the door likewise has a right-angled or quadratic form.

7. Device according to claim 1, characterized in that, the door is pivotally mounted at one side by means of at least one pivot joint and has at the other side, a locking device.

8. Device according to claim 7, characterized in that, a elastically yielding mount is integrated into at least one of the pivot joint and the locking device of the door.

9. Device according to claim 7, characterized in that, one of said joint and locking parts is mounted to be displaceable transversely of the opening surface of the charging aperture and is biased inwardly.

10. Device according to claim 9, characterized in that, at least one of the joint and a locking part associated with the housing is formed by means of a bar extending at right angles to the door, which bar is mounted to be longitudinally displaceable along its middle axis in a guide hole of a mounting piece, and in that the door is pivotally mounted on the door end of the bar.

7

11. Device according to claim 10, characterized in that, the joint bar is biased inwardly against a stop by means of a spring.

12. Device according to claim 11, characterized in that, a switch is associated with the stop, which, switch delivers to the associated control device a signal for switching off the heating device.

13. Device according to claim 1,

characterized in that,

the door is mounted to be displaceable from said aperture in at least one of several directions which include movement in parallel to itself and swingable and tilt-able movement.

14. Device according claim 1, characterized in that, there is provided an adjustment device for adjustment of the movable joint part transversely of the opening surface of the charging aperture.

15. Device according to claim 14, characterized in that, the joint bar is telescopicable, by means of a threaded nut screwed onto its rearward end or a screwed-in screw.

16. Device according to claim 1 wherein the housing has, in a wall thereof, a set of perforations which are so dimensioned in relation to the thickness of said wall that no microwaves emerge through said perforations.

8

17. Device according to claim 16, characterized in that, there are provided respective sets of perforations in at least two walls of the housing, and there is provided for one set of perforations a ventilation device for a gas for the heating chamber.

18. Device for the treatment of materials in accordance with claim 1, characterized in that,

a pressure sensor is associated with the heating chamber, and

a control or regulation device is associated with the pressure sensor, which control or regulation device so controls the heating power of the microwave heating device when a particular pressure value in the heating chamber is exceeded that the pressure in said heating chamber does not exceed a predetermined pressure value.


19. Device according to claim 18, characterized in that, the pressure sensor detects the movement of the door for the purpose of generating a control signal for the control or regulation of the heating power.

\* \* \* \* \*

**Oven with integral speech generating unit.**

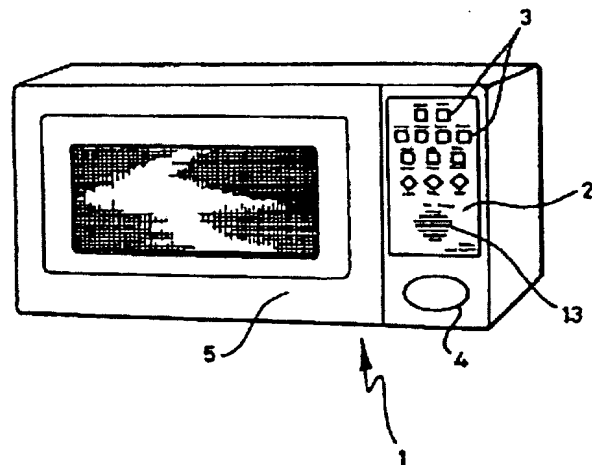
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**Publication date:** 1997-01-08  
**Inventor:** HOGG THOMAS  
**Applicant:** COBOLT SYSTEMS LTD (GB)  
**Classification:**  
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- **European:** H05B6/70, H05B6/68M2, H05B6/80D  
**Application number:** GB19960011728 19960605  
**Priority number(s):** GB19950011748 19950609

Also published as:

 WO9642185 (A1)

**Abstract of GB2302188**

The oven gives audio information, in speech form, to the user. The oven, which may be a microwave oven, has externally situated keys 3, one of which activates the speech generating unit. Audio information produced may be instructions such as to stir or turn food, or status information such as whether the door is open or closed. A talking clock and/or timer may also be incorporated. The oven may also respond to audio commands, and may not have any conventional visual indications.



**Fig. 1**

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## Oven with integral speech generating unit.

### Description of GB2302188

#### OVEN

##### Field of the Invention

This invention relates to the field of ovens especially - but not exclusively suitable for use by blind or other visually-impaired people.

##### Summary of the Invention

According to the inventive concept, such an oven, of the general kind which is otherwise known per se, is characterised by the incorporation of an integral speech-generating unit which, in use, enables the oven to give audio information in speech form to the user. In a preferred form the oven is a microwave oven.

Specifically, the invention provides an oven in which the oven's operation is actuated and controlled by the action of a plurality of externally-situated keys, wherein at least one of the externally-situated keys is connected to an integral speech-generating unit incorporated into the oven such that, once the key is actuated, the speech-generating unit is also actuated.

Preferably, the speech-generating unit and the oven's conventional operation are, at least partially, actuatable using audio (ie, vocal) commands.

Ideally, the oven is provided with a single control panel for controlling both the speech-generating unit and the oven's conventional operation.

In a preferred form, the speech-generating unit is adapted to provide audio instructions to stir and/or turn food in the oven, as necessary.

Advantageously, the speech-generating unit is adapted to provide audio information, for example regarding the status of the oven door, when the oven door is opened or closed.

Preferably, the oven further comprises an integral talking clock. Ideally, the oven further comprises an integral talking timer, independently operable from the oven's conventional operation.

In a preferred form, the speech-generating unit is adapted to provide audio information either automatically or on request, regarding the cooking time and function(s) selected.

Ideally, the oven is further provided with a tactile keypad, preferably having relatively large keys.

In a further preferred form, the oven is characterised in that it has no conventional visual indication (such as an LED display) of the status of said oven.

#### Brief Description of the Drawings

A preferred embodiment of the invention will now be more particularly described, by way of example only, with reference to the accompanying drawings wherein:

Figure 1 is a perspective view of an oven embodying the invention;

Figure 2 is a block diagram of the control system of the oven;

Figure 3 is a front view of the keypad panel;

Figure 4 is a side view of the keypad panel;

Figure 5 is a rear view of the keypad panel.

#### Description of the Preferred Embodiment

Figure 1 shows a microwave oven 1 having a keypad 2 by which both the microwave oven's normal cooking operation is controlled as well as the speech-generating unit's function. The entire speech-generating technology (not shown) is contained within the microwave oven's outer housing.

The keypad 2 comprises a number of tactile keys 3 which are relatively large in comparison to conventional microwave oven control keys. These easily felt keys 3 thus facilitate use of the microwave oven by a blind or other visually-impaired person. A particularly large and distinctive key 4 is used to control the opening and closing of the microwave oven door 5.

Figure 2 shows, in block diagram format, the control system for the microwave oven 1. A central processing unit ("CPU") 6 handles input data from the following sources: 1. Power supply 7.

2. Reset system 17 and clock signal 18 derived from the mains supply.

3. Door switch 8 indicates the status of the microwave oven door 5 i.e whether it is currently open or closed.

4. Keypad 2 is the user interface, providing input data from the user's operation of keys 3 (or vocal commands).

CPU 6 processes this input data to provide outputs to the microwave magnetron 10 which controls the oven's cooking operation and also to the speech system, filters and amplifiers 11 which govern the oven's speech operation.

CPU 6 also controls the microwave oven's internal lamp 12, turntable motor 15 and cooling fan 16. These power outputs (including magnetron 10) use zero crossing detect opto-isolators and triacs with snubber networks etc.

Interlocks (not shown) provide further information regarding the current status of the microwave oven, for example whether the microwave power is currently activated.

The microwave oven's speech-generating function enables a blind or otherwise visually-impaired person to use the oven without assistance as the oven provides spoken advice and requests to facilitate the cooking operation.

A wide range of spoken function is envisaged, at least corresponding to conventional microwave oven functions, and including (by way of example only):  
Automatic spoken advice when: the door 5 is opened or closed; cooking time and power level is selected; cooking cycle starts, giving the cooking/defrost time required; the food needs to be turned and/or stirred; the selected cooking or defrosting programme is complete.

Selectable advice of: the time remaining during a cooking/defrosting programme; the actual time, from an integral clock;  
the currently selected power level;  
the currently selected programme duration;  
a description or title of the selected programme, for example by food type and/or weight.

The speech output is provided by loudspeaker 13 and is of adjustable volume.

An integral general-purpose talking kitchen timer (not shown) could be independently operable from the oven timer.

Figures 3-5 show a suitable keypad panel 14 for use on the exterior of microwave oven 1.

The microwave oven not only provides spoken information on request by the user, but also gives "active" instructions, such as a request to the user to stir food during the cooking operation, or instructions to close the oven door before the cooking operation can commence.

Keypad 2 with tactile keys 3 could be replaced by (or used in conjunction with) an audio user interface so that the user could control the oven using spoken commands. Other inputs methods such as mouse, light pen etc could be used.

Alternatively, the tactile keys 3 could be replaced by conventional (ie.

normally sized and shaped) keys for use by a user with normal vision. In this way, an oven of normal outward appearance could have the advantages of spoken advice and instructions to the user as outlined above to facilitate the oven's use.

Unlike a conventional microwave oven, instructions may be input by the user in any (not necessarily logical) order. Each entered instruction is stored so that, if the user inadvertently presses an incorrect button, the previously entered instructions are not lost.

Also, unlike a conventional microwave oven, the oven clock need not necessarily be set before the oven can be used. Cooking and timer functions are independent of the clock but, if the user selects the clock itself when it has not been set, spoken advice is given by the oven.

The oven of the present invention thus enables a blind or otherwise visuallyimpaired person to use it without needing assistance from a sighted person to read a, normally relatively small, visual display and controls as on a conventional microwave oven. Indeed, the oven of the present invention may not even be provided with the conventional (usually LED) visual display.

The oven is equally suitably used by a generally handicapped person, who is not necessarily visually-impaired, or an able-bodied person who prefers the convenience of spoken commands/information.

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**Oven with integral speech generating unit.**

Claims of GB2302188

**CLAIMS**

1. An oven, of the general kind which is otherwise known per se, characterised by the incorporation of an integral speech-generating unit which, in use, enables the oven to give audio information in speech form to the user.
2. An oven as claimed in Claim 1 in which the oven's operation is actuated and controlled by the action of a plurality of externally situated keys, wherein at least one of the externally-situated keys is connected to an integral speech-generating unit incorporated into the oven such that, once the key is actuated, the speech-generating unit is also actuated.
3. An oven as claimed in Claim 1 or Claim 2 wherein the oven's operation and speech-generating unit are, at least partially, actuatable using audio (ie, vocal) commands.
4. An oven as claimed in any of the preceding claims wherein said oven is a microwave oven.
5. An oven as claimed in any of the preceding claims wherein the oven is provided with a single control panel for controlling both the speech generating unit and the oven's conventional operation.
6. An oven as claimed in any of the preceding claims wherein the speech-generating unit is adapted to provide audio instructions to stir and/or turn food in the oven, as necessary.
7. An oven as claimed in any of the preceding claims wherein the speech-generating unit is adapted to provide audio information, for example regarding the status of the oven door, when the oven door is opened or closed.
8. An oven as claimed in any of the preceding claims wherein said oven further comprises an integral talking clock.
9. An oven as claimed in any of the preceding claims wherein the oven further comprises an integral talking timer, independently operable from the oven's conventional operation.
10. An oven as claimed in any of the preceding claims wherein the speech-generating unit is adapted to provide audio information either automatically or on request, regarding the cooking time and function(s) selected.
11. An oven as claimed in any of the preceding claims wherein the oven is further provided with a tactile keypad.
12. An oven as claimed in Claim 11 wherein said tactile keypad has relatively large keys.
13. An oven as claimed in any of the preceding claims characterised in that said oven has no conventional visual indication (such as an LED display) of the status of said oven.
14. An oven substantially as described herein with reference to and as illustrated by any appropriate combination of the accompanying drawings.

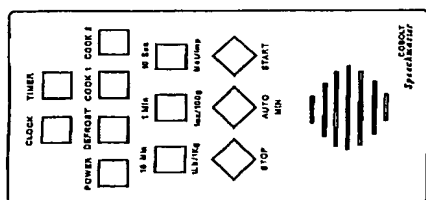


Figure 3

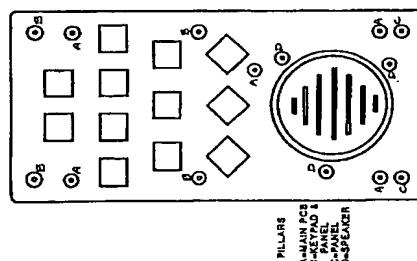
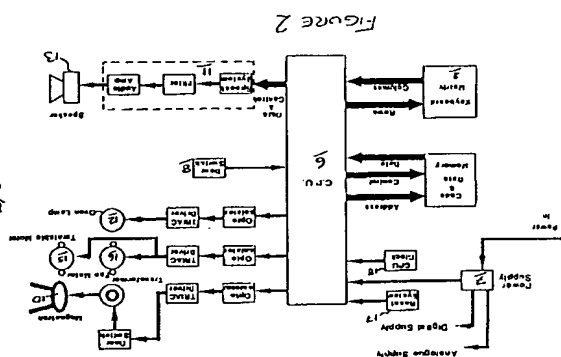


Figure 5

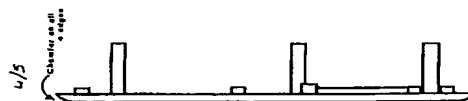
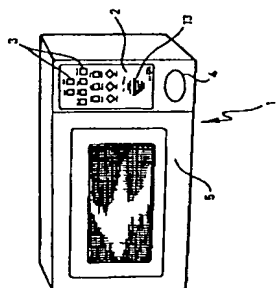


Figure 4

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(51) INT CL<sup>6</sup>

**F24C 7/08**

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**G3N NG1A2 N277D N390 N404 N405 N407**

**U1S S1912 S1975**

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(58) Field of Search

**UK CL (Edition O ) G3N NGA9 NG1A1 NG1A2 NG1A9  
N407**

**INT CL<sup>6</sup> F24C 7/02 7/08**

**ONLINE: CLAIMS, JAPIO, WPI**

(54) Oven with integral speech generating unit.

(57) The oven gives audio information, in speech form, to the user. The oven, which may be a microwave oven, has externally situated keys 3, one of which activates the speech generating unit. Audio information produced may be instructions such as to stir or turn food, or status information such as whether the door is open or closed. A talking clock and/or timer may also be incorporated. The oven may also respond to audio commands, and may not have any conventional visual indications.

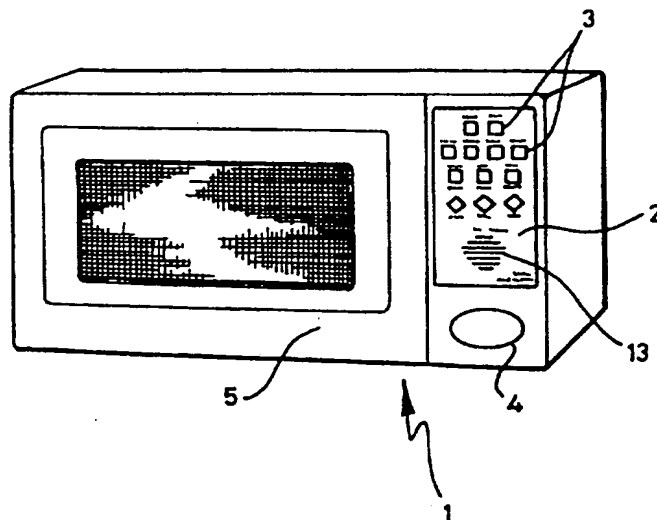
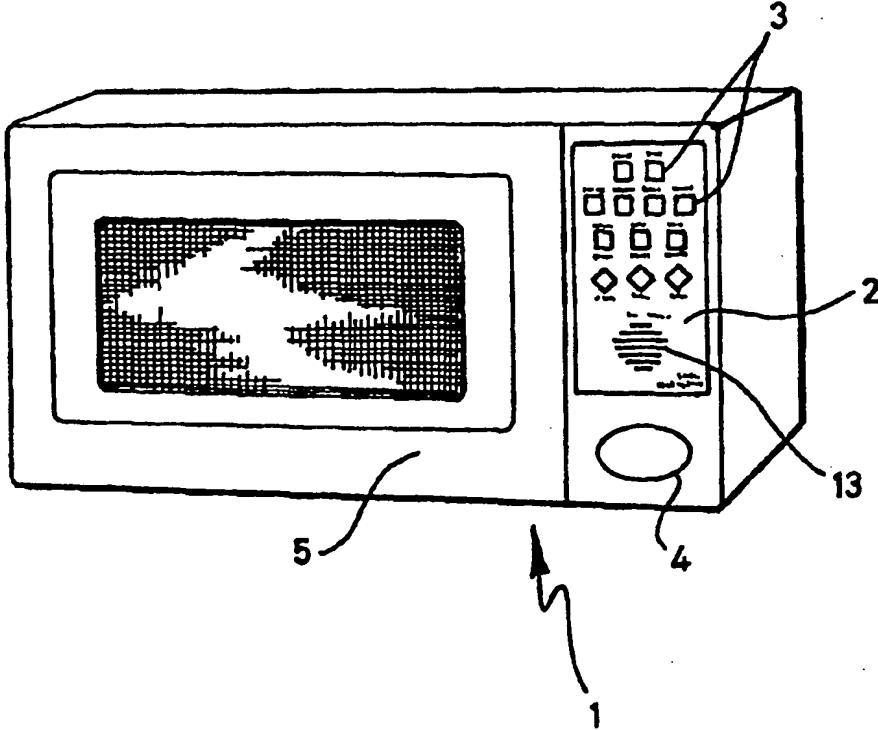


Fig. 1

GB 2 302 188 A

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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification 6 :</b> <b>H05B 6/68, 6/80</b>	<b>A1</b>	<b>(11) International Publication Number:</b> <b>WO 96/42185</b> <b>(43) International Publication Date:</b> 27 December 1996 (27.12.96)
<b>(21) International Application Number:</b> PCT/GB96/01263 <b>(22) International Filing Date:</b> 5 June 1996 (05.06.96) <b>(30) Priority Data:</b> 9511748.7      9 June 1995 (09.06.95)      GB <b>(71) Applicant (for all designated States except US):</b> COBOLT SYSTEMS LIMITED [GB/GB]; The Old Mill House, Mill Road, Reedham, Norwich, Norfolk NR13 3TL (GB). <b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only):</b> HOGG, Thomas [GB/GB]; The Old Mill Road, Mill Road, Reedham, Norwich, Norfolk NR13 3TL (GB). <b>(74) Agent:</b> JONES, William; Willow Lane House, Willow Lane, Norwich, Norfolk NR2 1EU (GB).		<b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i>
<b>(54) Title:</b> OVEN  <b>(57) Abstract</b> <p>An oven, of the general kind which is otherwise known <i>per se</i>, characterised by the incorporation of an integral speech-generating unit which, in use, enables the oven to give audio information in speech form to the user.</p> 		

instructions to stir and/or turn food in the oven, as necessary.

Advantageously, the speech-generating unit is adapted to provide audio information, for example regarding the status of the oven door, when the oven door is opened or closed.

- 5 Preferably, the oven further comprises an integral talking clock. Ideally, the oven further comprises an integral talking timer, independently operable from the oven's conventional operation.

10 In a preferred form, the speech-generating unit is adapted to provide audio information either automatically or on request, regarding the cooking time and function(s) selected.

Ideally, the oven is further provided with a tactile keypad, preferably having relatively large keys.

15 In a further preferred form, the oven is characterised in that it has no conventional visual indication (such as an LED display) of the status of said oven.

#### Brief Description of the Drawings

A preferred embodiment of the invention will now be more particularly described, by way of example only, with reference to the accompanying drawings wherein:

20 Figure 1 is a perspective view of an oven embodying the invention;

Figure 2 is a block diagram of the control system of the oven;

Figure 3 is a front view of the keypad panel;

Figure 4 is a side view of the keypad panel;

-2-

instructions to stir and/or turn food in the oven, as necessary.

Advantageously, the speech-generating unit is adapted to provide audio information, for example regarding the status of the oven door, when the oven door is opened or closed.

- 5 Preferably, the oven further comprises an integral talking clock. Ideally, the oven further comprises an integral talking timer, independently operable from the oven's conventional operation.

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#### Brief Description of the Drawings

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20 Figure 1 is a perspective view of an oven embodying the invention;

Figure 2 is a block diagram of the control system of the oven;

Figure 3 is a front view of the keypad panel;

Figure 4 is a side view of the keypad panel;

Figure 5 is a rear view of the keypad panel.

### Description of the Preferred Embodiment

5 Figure 1 shows a microwave oven 1 having a keypad 2 by which both the microwave oven's normal cooking operation is controlled as well as the speech-generating unit's function. The entire speech-generating technology (not shown) is contained within the microwave oven's outer housing.

10 The keypad 2 comprises a number of tactile keys 3 which are relatively large in comparison to conventional microwave oven control keys. These easily felt keys 3 thus facilitate use of the microwave oven by a blind or other visually-impaired person. A particularly large and distinctive key 4 is used to control the opening and closing of the microwave oven door 5.

Figure 2 shows, in block diagram format, the control system for the microwave oven 1. A central processing unit ("CPU") 6 handles input data from the following sources:-

- 15 1. Power supply 7.
2. Reset system 17 and clock signal 18 derived from the mains supply.
3. Door switch 8 indicates the status of the microwave oven door 5 i.e whether it is currently open or closed.
- 20 4. Keypad 2 is the user interface, providing input data from the user's operation of keys 3 (or vocal commands).

CPU 6 processes this input data to provide outputs to the microwave magnetron 10 which controls the oven's cooking operation and also to the speech system, filters and amplifiers 11 which govern the oven's speech operation.

25 CPU 6 also controls the microwave oven's internal lamp 12, turntable motor

-5-

- a description or title of the selected programme, for example by food type and/or weight.

The speech output is provided by loudspeaker 13 and is of adjustable volume.

5 An integral general-purpose talking kitchen timer (not shown) could be independently operable from the oven timer.

Figures 3-5 show a suitable keypad panel 14 for use on the exterior of microwave oven 1.

10 The microwave oven not only provides spoken information on request by the user, but also gives "active" instructions, such as a request to the user to stir food during the cooking operation, or instructions to close the oven door before the cooking operation can commence.

15 Keypad 2 with tactile keys 3 could be replaced by (or used in conjunction with) an audio user interface so that the user could control the oven using spoken commands. Other inputs methods such as mouse, light pen etc could be used.

20 Alternatively, the tactile keys 3 could be replaced by conventional (ie. normally sized and shaped) keys for use by a user with normal vision. In this way, an oven of normal outward appearance could have the advantages of spoken advice and instructions to the user as outlined above to facilitate the oven's use.

Unlike a conventional microwave oven, instructions may be input by the user in any (not necessarily logical) order. Each entered instruction is stored so that, if the user inadvertently presses an incorrect button, the previously entered instructions are not lost.

25 Also, unlike a conventional microwave oven, the oven clock need not necessarily be set before the oven can be used. Cooking and timer functions are independent of the clock but, if the user selects the clock itself when it



has not been set, spoken advice is given by the oven.

5 The oven of the present invention thus enables a blind or otherwise visually-impaired person to use it without needing assistance from a sighted person to read a, normally relatively small, visual display and controls as on a conventional microwave oven. Indeed, the oven of the present invention may not even be provided with the conventional (usually LED) visual display.

The oven is equally suitably used by a generally handicapped person, who is not necessarily visually-impaired, or an able-bodied person who prefers the convenience of spoken commands/information.

CLAIMS

1. An oven, of the general kind which is otherwise known *per se*, characterised by the incorporation of an integral speech-generating unit which, in use, enables the oven to give audio information in speech form to the user.  
5
2. An oven as claimed in Claim 1 in which the oven's operation is actuated and controlled by the action of a plurality of externally-situated keys, wherein at least one of the externally-situated keys is connected to an integral speech-generating unit incorporated into the oven such that, once the key is actuated, the speech-generating unit is also actuated.  
10
3. An oven as claimed in Claim 1 or Claim 2 wherein the oven's operation and speech-generating unit are, at least partially, actuable using audio (ie, vocal) commands.
- 15 4. An oven as claimed in any of the preceding claims wherein said oven is a microwave oven.
5. An oven as claimed in any of the preceding claims wherein the oven is provided with a single control panel for controlling both the speech-generating unit and the oven's conventional operation.
- 20 6. An oven as claimed in any of the preceding claims wherein the speech-generating unit is adapted to provide audio instructions to stir and/or turn food in the oven, as necessary.
7. An oven as claimed in any of the preceding claims wherein the speech-generating unit is adapted to provide audio information, for example regarding the status of the oven door, when the oven door is opened or closed.  
25
8. An oven as claimed in any of the preceding claims wherein said oven

further comprises an integral talking clock.

9. An oven as claimed in any of the preceding claims wherein the oven further comprises an integral talking timer, independently operable from the oven's conventional operation.
- 5 10. An oven as claimed in any of the preceding claims wherein the speech-generating unit is adapted to provide audio information either automatically or on request, regarding the cooking time and function(s) selected.
- 10 11. An oven as claimed in any of the preceding claims wherein the oven is further provided with a tactile keypad.
12. An oven as claimed in Claim 11 wherein said tactile keypad has relatively large keys.
- 15 13. An oven as claimed in any of the preceding claims characterised in that said oven has no conventional visual indication (such as an LED display) of the status of said oven.
14. An oven substantially as described herein with reference to and as illustrated by any appropriate combination of the accompanying drawings.

1/5

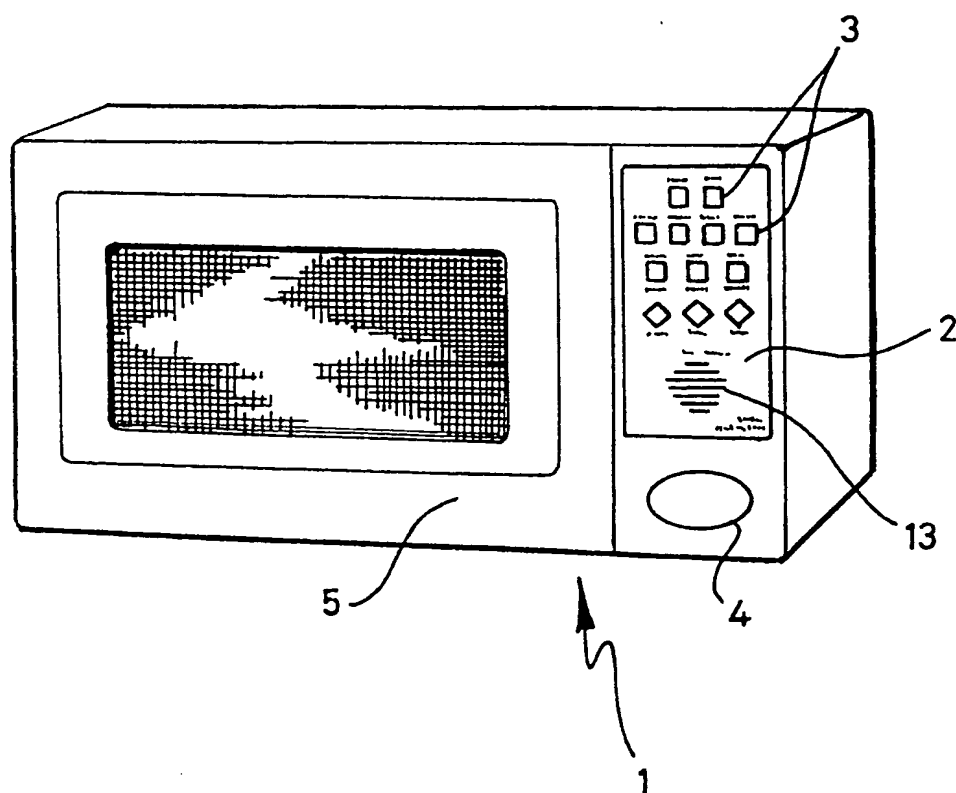


Fig. 1

2/5

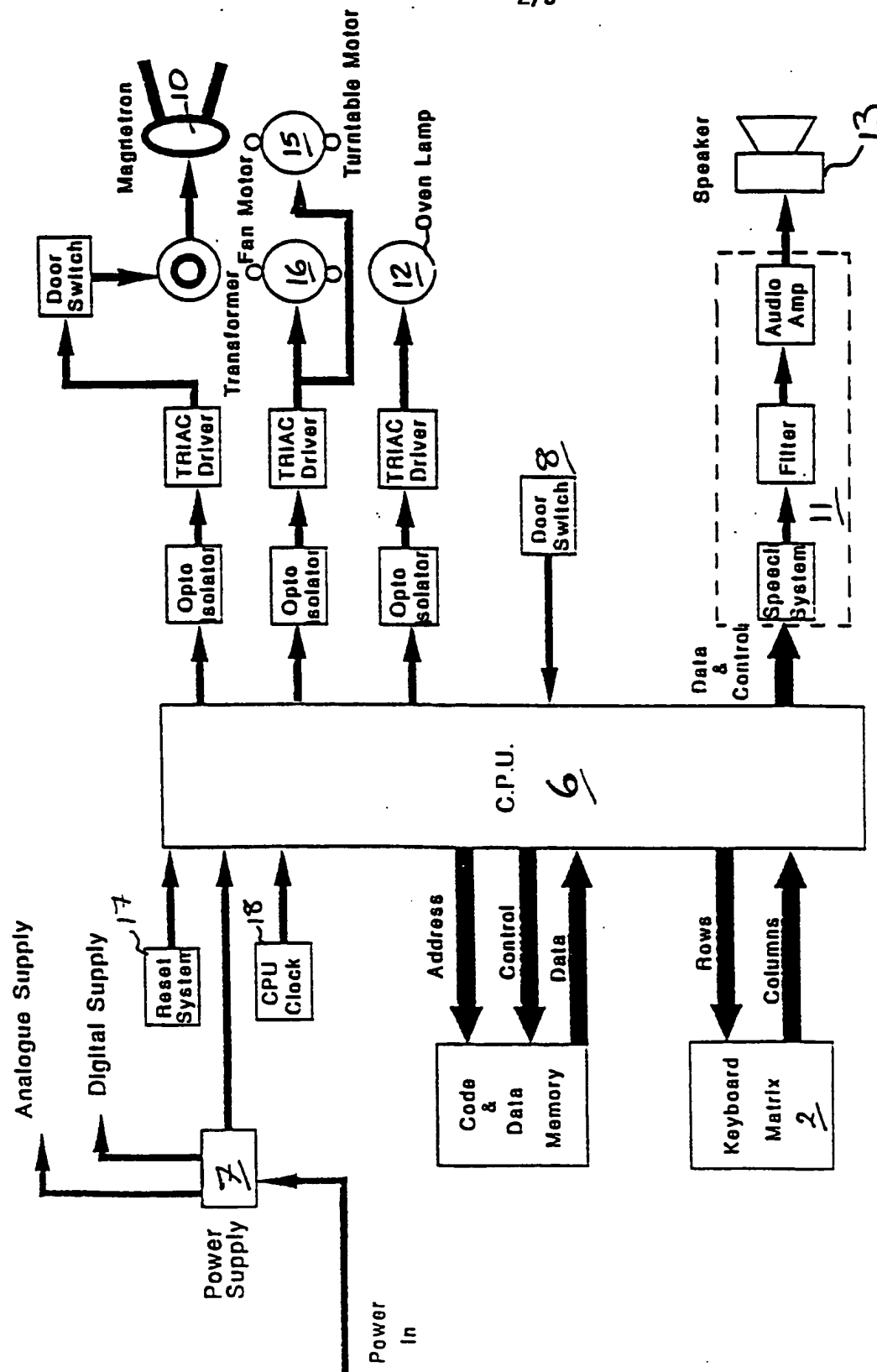


FIGURE 2

3/5

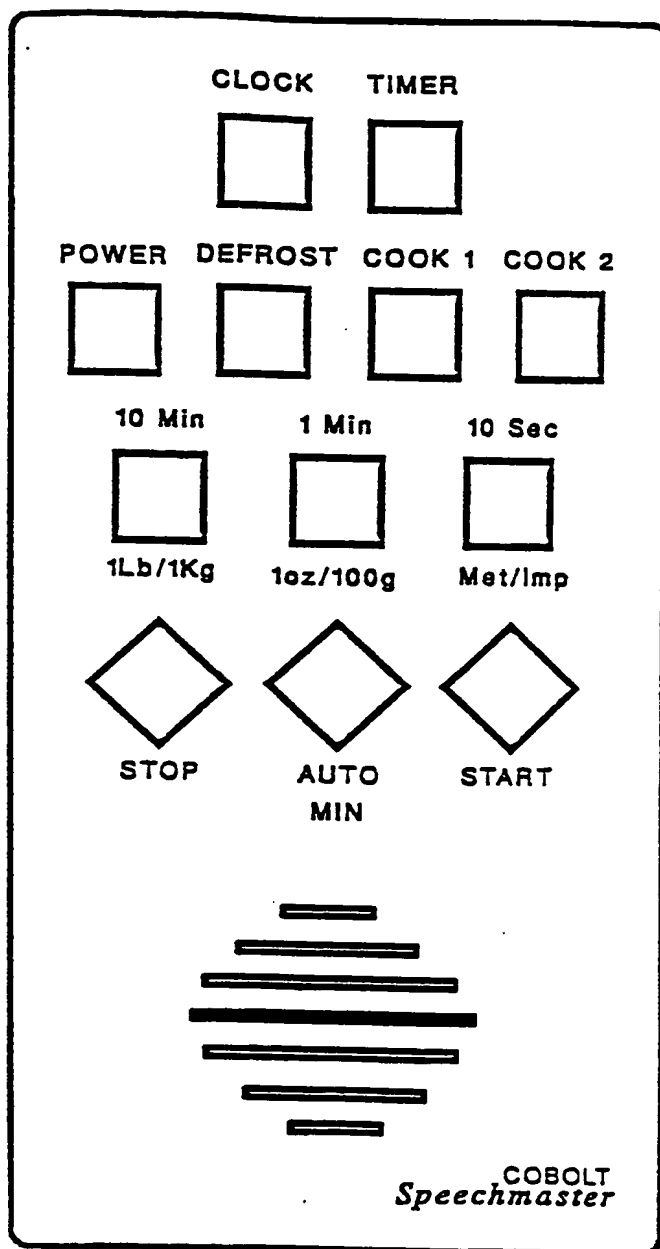


FIGURE 3

4/5

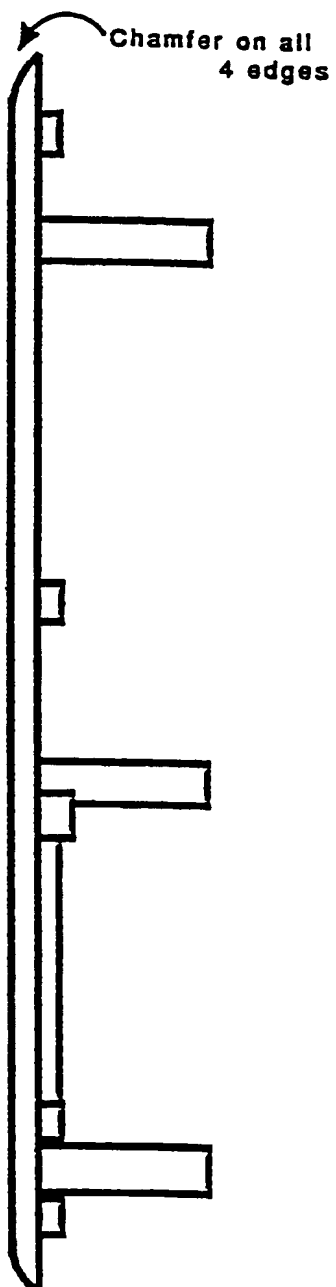


FIGURE 4

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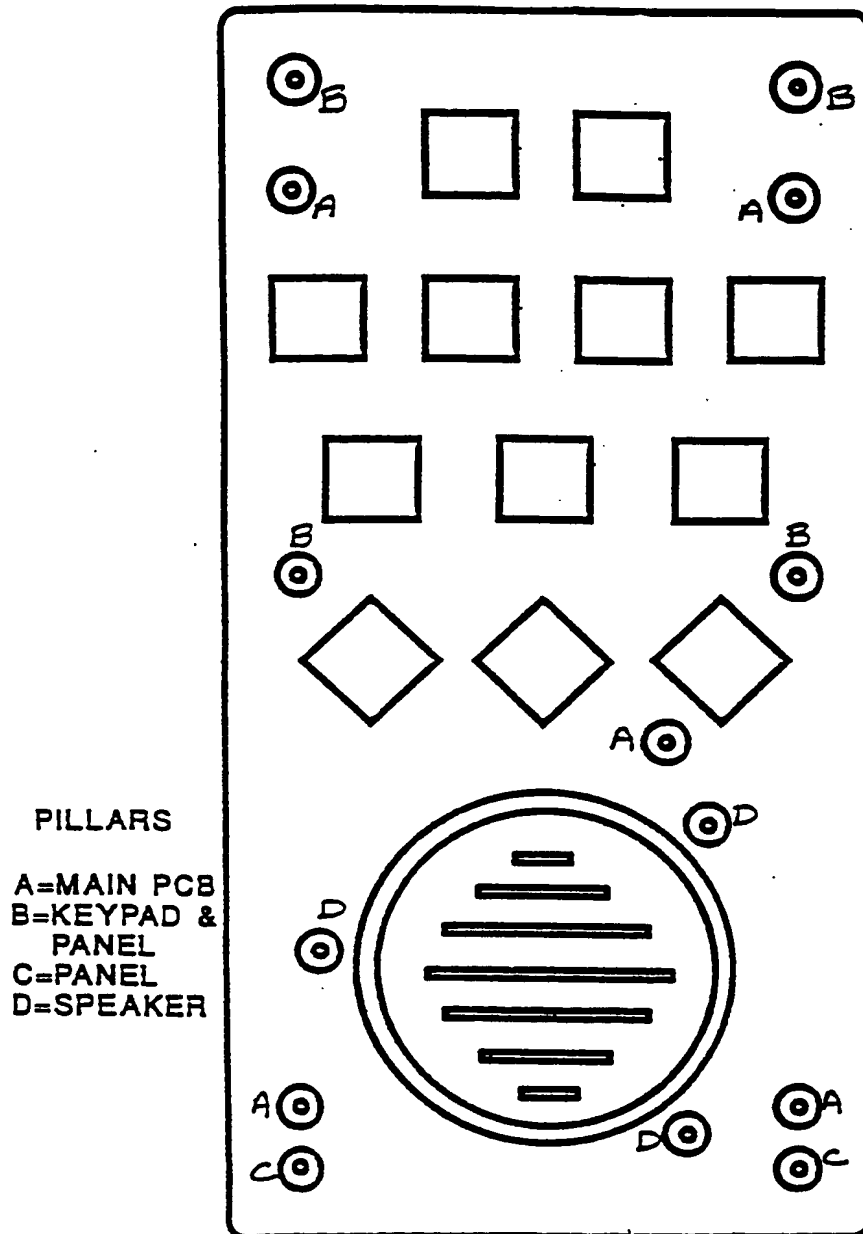


FIGURE 5



# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 96/01263

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



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**Electrothermic controlled locking device for an appliance door**

**Patent number:** EP1388604  
**Publication date:** 2004-02-11  
**Inventor:** HENGELIN GUENTER (DE); HARRER HUBERT (DE);  
SCHMIDT WOLFGANG (DE)  
**Applicant:** ELLENBERGER & POENSGEN (DE)  
**Classification:**  
- **international:** D06F37/42; D06F39/14; A47L15/42; D06F49/00  
- **european:** D06F49/00B, A47L15/42F, D06F37/42, D06F39/14,  
F24C15/02B  
**Application number:** EP20030017945 20030806  
**Priority number(s):** DE20021036777 20020810

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more >>

**Abstract of EP1388604**

The electrically controlled lock for the door of an oven (3) with pyrolytic self cleaning actuates if the operation of the oven is interrupted. The lock has a bimetallic drive (22) which releases the lock if the local surrounding temperature is lower than a preset value. The lock can have a heater resistance element (25) to move the bimetallic drive over the locking temperature.

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